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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,962	11/14/2001	Charles C. Haluzak	10990818-2	8223

7590 11/17/2004

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Intellectual Property Administration
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EXAMINER

TUGBANG, ANTHONY D

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/003,962

Applicant(s)

HALUZAK ET AL.

Examiner

A. Dexter Tugbang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-23 is/are pending in the application.
- 4a) Of the above claim(s) 22 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-18 is/are rejected.
- 7) ☒ Claim(s) 19-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/30/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, Claims 19-21 in the reply filed on 9/13/04 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 22 and 23 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 9/13/04.

Specification

3. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

4. The abstract of the disclosure is objected to because the content is not directed to the claimed invention, i.e. process of making. Correction is required. See MPEP § 608.01(b).

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: A Method of Manufacturing a Fully Integrated Printhead Using Silicon on Insulator Wafer.

Claim Objections

6. Claim 15 is objected to because of the following informalities.

In Claim 15, the phrase of “each chamber having within it” (line 3) is awkwardly worded. The examiner suggest replacing the phrase with –including said ink ejection element within each said ink ejection chamber--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

8. Claims 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 17, the phrase of “said silicon substrate” (line 2) lacks positive antecedent basis.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Tsung Pan 4,894,664, Miller et al 5,679,593, and Gilbert et al 5,773,326.

Tsung Pan discloses a method of forming a printhead comprising: providing a printhead substrate 10 (in Fig. 3); forming thin film layers (thermal barrier layer 21 and Ni layer 40) on the a first surface of the substrate, at least one of the layers forming ink ejection elements 15; forming ink feed holes through the thin film layers; and forming at least one opening (well 11) in the substrate providing an ink path from a second bottom surface of the substrate, through the substrate, to the ink feed holes formed in the thin film layers.

Regarding Claim(s) 15, Tsung Pan further teaches forming an orifice layer 19 over the thin film layers, the orifice layer defining ink ejection chambers (wider bottom portion of 17 in Fig. 3) and within each chamber is included the ink ejection element 15. The orifice layer further defines a nozzle (top portion of 17).

Regarding Claim(s) 16, Tsung Pan further teaches that the ink ejections elements 15 reside on a cantilevered silicon bridge 12 between two side portions (of substrate 10) having a thicker silicon dimension in the horizontal direction. Tsung Pan suggests that the substrate 10 can be made of silicon (see col. 3, lines 2-4).

Regarding Claim(s) 17 and 18, Tsung Pan further teaches that the at least one opening (well 11) is formed by etching in a silicon substrate 10 (see col. 3, lines 24-27) with the opening (well 11) extending a length of a row of at least 3 of the ink ejection elements 15.

In summary above, Tsung Pan teaches substantially all of the limitations of the claimed manufacturing method except that the “ink ejection elements reside over a silicon layer” (as required at line 8 of Claim 14).

The examiner notes that ink ejections elements are thermal resistors and that it is conventional and well known in the art to form a silicon layer in combination with the substrate as a SOI substrate for the purpose of supporting resistors. As evidence of obviousness, the examiner cites Miller et al, which shows a SOI substrate 10 (in Fig. 3) supporting resistors, and Gilbert et al, which shows a SOI substrate 10 supporting resistors (see col. 3, lines 53-65). Moreover, Miller and Gilbert each have associated advantages of utilizing a SOI substrate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the substrate of Tsung Pan by adding a silicon layer to form a SOI substrate, as taught by Miller and Gilbert, to at least conventionally support the ink ejection elements, i.e. resistors, and for each associated advantage therewith, where the ink ejection elements would reside over the silicon layer and the substrate.

Allowable Subject Matter

11. Claims 19-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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12. The following is a statement of reasons for the indication of allowable subject matter.

With respect to dependent Claim 19, which includes all of the limitations of Claim 14, the prior art does not teach that the printhead substrate is a silicon-on-insulator substrate with a first silicon layer, a thinner second silicon layer, and an oxide layer between the first silicon layer and the second silicon layer where the step of forming the at least one opening in the substrate comprises: etching the first silicon layer of the SOI substrate using a wet etch to etch a trench in the first silicon layer extending to the oxide layer, etching the at least one opening in the oxide layer, and etching the at least one opening in the second silicon layer to form an ink path between a backside of the SOI substrate and a topside of the SOI substrate.

Conclusion

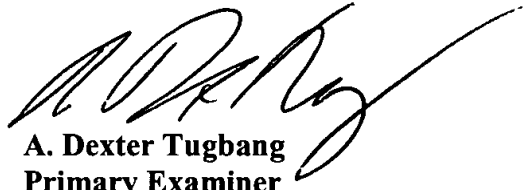
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 703-308-7599. The examiner can normally be reached on Monday - Friday 7:00 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



A. Dexter Tugbang
Primary Examiner
Art Unit 3729

November 15, 2004